3.10 Environmental

Background

The objective of conducting an environmental overview as part of the master planning process is two-fold: a. to describe the existing environmental conditions at the Airport and surrounding areas, and b.. to identify potential environmental issues, avoidance and/or mitigation options during the planning, design and construction of proposed airport development projects.

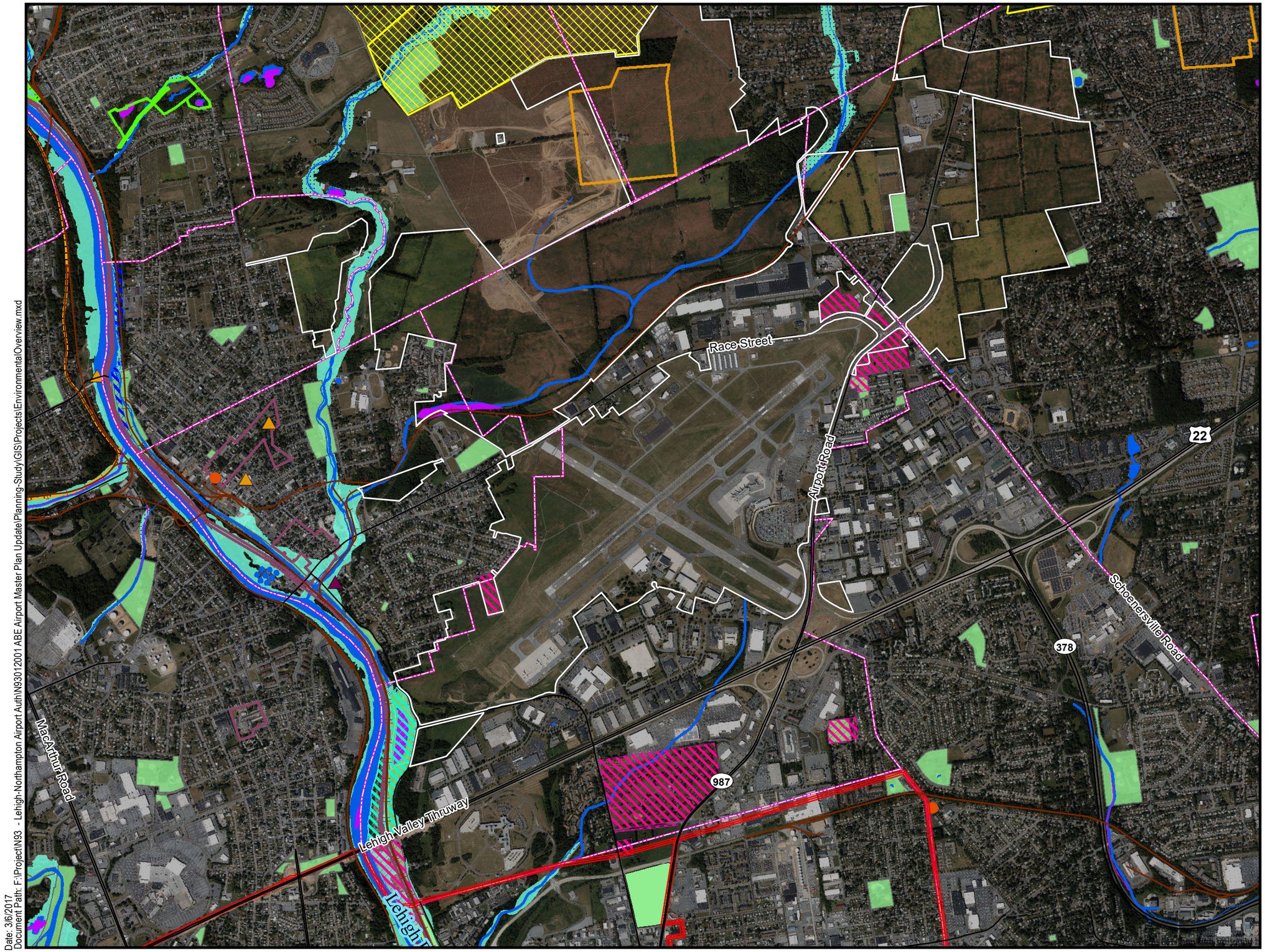
The environmental overview has been prepared in reference to the National Environmental Policy Act of 1969 (NEPA), as amended; and relevant Commonwealth of Pennsylvania regulations and procedures. Guidance provided in the FAA's Order 5050.4B, Environmental Handbook, and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and the FAA's 1050.1F Desk Reference were used to prepare the environmental overview.

This environmental overview does not replace environmental documents such as an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that may be required for proposed actions resulting from the Airport Master Plan. To obtain federal environmental clearance for any proposed projects at the Airport, a full environmental evaluation document prepared in accordance with the U.S. DOT policy, FAA Order 5050.4B, FAA Order 1050.1F, and Council on Environmental Quality (CEQ) Regulations will be required.

The environmental discussion that follows focuses on describing the current environmental conditions within the Airport and its environs, as well as a preliminary discussion of potential environmental impacts that may be associated with proposed development included in the Airport Master Plan Update. Additional information will be provided during the development and evaluation of alternatives; however, detailed impacts and mitigation as they relate to specific development projects will be addressed during the preparation of the appropriate NEPA documents when proposed projects are ready for environmental review.

Environmental Overview

The Environmental Overview Map, shown on **Figure 3.10.1**, depicts various aspects of the Airport property and its vicinity including environmental features discussed in the following sections. All correspondence for environmental consultation and reference of publicly accessible databases conducted during this analysis are documented in **Appendix C – Inventory Materials.**



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Legend

- Airport Property Line
- Streets
- Railroads
- DCNR Rail Trails
- Streams & Rivers
- Impaired Streams & Rivers
- Municipal Boundaries
- Environmental Justice Areas
- Agricultural Security Areas
- Agricultural Protection Zone
- Conservancy District
- Conservation Zone
- Flood Hazard Protection Zone
- Limited Use Zone
- River Conservation Zone
- Park
- FWS Wetlands
- Ponds & Lakes
- FEMA 100-Year Flood Zone A
- FEMA 100-Year Flood Zone AE
- EPA Brownfield Sites

National Park Service National Historic Landmarks

- Eligible District/Property
- Listed District/Property
- Eligible Landmark/Structure
- Listed Landmark/Structure

N

0 5001,000 2,000 3,000 Feet

1 inch = 2,000 feet
When printed at 11' x 17'

Lehigh Valley International Airport
Master Plan Update

Environmental Overview

Figure 3.10.1

Sources: SOURCES: Airport Property Line from Lehigh Northampton Airport Authority, County Subdivisions & Water Features from Census Bureau 2016 TIGER files. National Historic Places digitized from CRGIS by C&S Engineers, Inc. and are not an accurate representation for precise location; Flood Layer from FEMA NFHL; Wetlands from FWS National Wetlands Mapper; Rail Trails and DCNR Parks from PASDA Geospatial Data Clearing House; EPA Sites from EPA EnviroFacts Data Downloads CSV Data; River Conservation Zones, Parks, Limited Use Zones, Flood Harzard Protection Zones, Conservation Zones, Conservancy Districts, and Agricultural Protection Zones from parcel data obtained through Lehigh and Northampton County; Source Layer: Aerial Imagery from Quantum Spatial CREATED: November 2016 by C&S Engineers

The following elements normally identified within an EA and described in the FAA 1050.1F Desk Reference will be considered in the environmental review.

1. Air Quality
2. Biological Resources
3. Climate
4. Coastal Resources
5. Department of Transportation Act, Section 4(f)
6. Farmlands
7. Hazardous Materials, Solid Waste, and Pollution Prevention
8. Historical, Architectural, Archeological, and Cultural Resources
9. Land Use
10. Natural Resources and Energy Supply
11. Noise and Noise-Compatible Land Use
12. Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
13. Visual Effects
14. Water Resources

At this stage of the Airport Master Plan Update, it is considered premature to include Cumulative Impacts and Irreversible and Irretrievable Commitment of Resources.

This effort is primarily based on existing information including the data and analysis in the Environmental Assessment for the FedEx Land Release regarding the property released to RDG along Willowbrook Road. No wetland mapping or detailed field investigation is included in this task.

Air Quality

With regard to airport development, impacts to air quality are commonly associated with an increase or change in aircraft operations as a result of an action undertaken or a short-term increase in fuel consumption by both off-road and on-road vehicles required for construction. To determine potential impacts as they relate to NEPA and the federal Clean Air Act (CAA) the FAA published the Aviation Emissions and Air Quality Handbook. The handbook provides airport sponsors and NEPA practitioners a step-by-step process in which to evaluate if a proposed action warrants an air quality analysis and to formulate an approach to preparing it, if necessary.

As discussed in Chapter 1 of the FAA Environmental Desk Reference for Airport Actions (Desk Reference, October 2007), the United States Environmental Protection Agency (EPA), through the CAA, has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), ozone, and lead. Unlike the other criteria pollutants, ozone (O_3) is not specifically emitted from a source, but rather generated through the photochemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). An area that violates a national primary or secondary NAAQS for one or more of the USEPA designated criteria pollutants is referred to as non-attainment. A maintenance area is one that has previously been in violation of the NAAQS but has since implemented an avoidance plan and has had no additional violations over an extended period of time.

Conformity

Under Section 176(c)(1) (conformity regulations) of CAA, an action subject to federal funding or approval must conform to the goals set forth in the State Implementation Plan (SIP) for nonattainment and maintenance areas in the state in which the action is to take place. In addition, NEPA requires that an assessment be conducted to determine if an action will generate emissions that exceed the NAAQS. However, if an action is unlikely to result in NAAQS violations, such an assessment is not required.

The EPA promulgated the initial conformity regulations in 1993 to assist federal agencies in complying with the SIP by specifying rules for two categories of federal actions: transportation actions and general actions. The two rules have separate and distinct applicability and evaluation requirements. Transportation conformity applies to highway and transit actions, and general conformity regulations apply to all other federal actions that are not transportation actions, such as airport improvement actions. The General Conformity Rule, published under 40 CFR Part 93, applies only to an action that is federally funded or federally approved, which will be the case for any of the projects depicted on the Airport Layout Plan developed through this planning process.

The General Conformity Rule applies to a federal action that is located in an area designated nonattainment or maintenance by the EPA. Only pollutants causing the area to be designated as nonattainment or maintenance are relevant and evaluated under the Rule. The net increase in emissions of the pollutants are compared against the threshold levels established in the Rule, known as the de minimis thresholds, published at 40 CFR 93.153(b)(1)-(b), Applicability Analysis. Under the General Conformity Rule, if the net increase in emissions due to a federal action equals or exceeds EPA established de minimis thresholds, a General Conformity Determination would be required.

NEPA

NEPA requires an analysis to assess an action's potential to exceed any NAAQS. However, where an action is unlikely to result in NAAQS violations, such an assessment is not required. PennDOT provides guidelines for evaluating carbon monoxide (CO) in PennDOT Publication 321: PennDOT Project-Level Air Quality Handbook, updated October, 2013. According to PennDOT Publication 321, NEPA project air quality analyses have typically focused on CO as the primary indicator for vehicular induced pollution. Over the last decade, the CO levels throughout Pennsylvania have dramatically improved, as demonstrated by the attainment status for CO throughout the state. While an evaluation of CO levels associated with transportation improvement projects will still be necessary, PennDOT and FHWA have developed several thresholds that are used to limit the number of projects requiring a detailed CO quantitative air quality analysis in order to streamline the NEPA process. Projects are compared against the thresholds based on their type, configuration, projected traffic volume, congestion, and location in order to determine if a quantitative analysis is required. These thresholds include an opening/design year annual average daily traffic (AADT) of less than 125,000 for mainline traffic in the project vicinity or an opening/design year overall LOS at intersection of A, B, or C within the project vicinity.

Conclusion

Potentially significant air quality impacts associated with an FAA action would be demonstrated by the action exceeding one or more of the NAAQS for any of the time periods analyzed. According to the USEPA Green

Book, Lehigh and Northampton Counties are classified as marginal non-attainment for ozone and non-attainment for $PM_{2.5}$. In addition, Pennsylvania is part of the ozone transport region.

Emissions resulting from the selected projects will need to be compared to the Clean Air Act De Minimis Thresholds, which provides the applicable thresholds for pollutants based on their non-attainment status. If the increase in emissions from the project does not equal or exceed these thresholds, the action is assumed to comply with the Rule and no further analysis is required under CAA Section 176(c)(1). If the threshold levels are exceeded, a General Conformity Determination would be required.

According to the USEPA Green Book,[38] Lehigh and Northampton Counties are classified as marginal non-attainment for the ozone (O_3) standards and were recently reclassified to maintenance for particulate matter under 2.5 microns ($PM_{2.5}$) standards. Ozone is not directly emitted from a source but is formed through the reaction of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. Emissions of ozone are evaluated based on emissions of the ozone precursor pollutants, NO_x and VOCs. Therefore, the applicability analysis for General Conformity only applies to $PM_{2.5}$, NO_x and VOCs.

Biological Resources

The Endangered Species Act (ESA) of 1973 provides federal protection for species that are facing potential extinction due to the loss of habitat. Consideration of biotic communities and endangered and threatened species is required for all proposals under the ESA. If an agency determines that an action "may affect" a federally protected species, then Section 7(a) (2) of the ESA requires the agency to consult with the US Fish and Wildlife Service (USFWS) to ensure that the action the authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of the federally listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Section 7(a) (4) states that each agency must confer with the USFWS.

According to the USFWS list of Federal Endangered and Threatened Species, there are four federally listed species with potential to occur on or adjacent to the airport property:

Table 3.10.1: Federally Listed Species

Species	Status
Flowering Plans	
Northeastern Bulrush	Endangered
Mammals	
Indiana Bat	Endangered
Northern Long-eared Bat	Threatened
Reptiles	
Bob Turtle	Threatened

Source: USFWS, Pennsylvania Ecological Services Field Office, Official Species List, November 16, 2016

[38] U.S. Environmental Protection Agency Green Book, September 22, 2016. https://www3.epa.gov/airquality/greenbook/anayo_pa.html

Projects involving a federal agency or federal funding are required to consult with the USFWS to ensure that project actions will not destroy or adversely modify critical habitat. According to the USFWS, there are no critical habitats or National Wildlife Refuges within the immediate vicinity of the Airport.

Because there is potential for federally listed species to occur on or near the Airport, a proposed action could potentially have adverse impacts in which further analysis is required. Dependent upon the level of analysis required and the agency providing funding for the proposed action, coordination should be completed with federal, state and local regulatory agencies to determine if the action would likely jeopardize a species' continued existence.

Climate

Greenhouse gases (GHG) are those that trap heat in the earth's atmosphere. Greenhouse gases such as water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3) are both naturally occurring and anthropogenic (man-made). There is presently a broad scientific consensus that human activities that produce GHGs are contributing to changes in the earth's atmosphere. These GHGs, brought about principally by the combustion of fossil fuels, decomposition of waste materials and release of refrigerants, cause an increase in the earth's average temperature – a phenomenon that is referred to as the "greenhouse effect."

Historically, GHG emissions had not been regulated under the CAA as air pollutants. However, after the United States Supreme Court in 2007 clarified that carbon dioxide is an "air pollutant" subject to regulation under the CAA, the EPA embarked on developing requirements and standards for GHG emissions from mobile and stationary sources under the CAA.

There are no federal standards for aviation-related GHG emissions. However, the CEQ has indicated that climate should be considered in NEPA analyses. The CEQ recently issued final guidance for addressing climate change suggesting that agencies consider "(1) The potential effects of a proposed action on climate change as indicated by assessing GHG emissions (e.g., to include, where applicable, carbon sequestration); and, (2) The effects of climate change on a proposed action and its environmental impacts" (CEQ, August 1, 2016). The guidance does not establish a significant impact threshold for GHGs, stating that "In light of the global scope of the impacts of GHG emissions, and the incremental contribution of each single action to global concentrations, CEQ recommends agencies use the projected GHG emissions associated with proposed actions as a proxy for assessing proposed actions' potential effects on climate change in NEPA analysis" (CEQ, August 1, 2016).[39]

As required by the Pennsylvania Climate Change Act of 2008, the Pennsylvania Department of Environmental Protection (DEP) and the Climate Change Advisory Committee prepared a Climate Change Action Plan and in 2009 that:

- "Identifies GHG emission and sequestration trends and baselines in the Commonwealth;
- "Evaluates cost-effective strategies for reducing or offsetting GHG emissions;

[39] https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf

- "Identifies costs, benefits and co-benefits of reduction strategies recommended;
- "Identifies areas of agreement and disagreement among committee members; and
- "Recommends to the General Assembly legislative changes necessary to implement the Action Plan."[40]

The Plan is updated every three years with the most recent version published in 2015. The Plan includes identification of climate change impacts by sector, quantification of GHG emissions, and strategies/initiatives to minimize and address climate change.

Based on federal guidance and the state's efforts, the identification and mitigation of potential impacts associated with the proposed actions should consider GHG emissions as well as the effects of climate change and its environmental impacts.

Coastal Resources

There are no coastal barriers or coastal zones in the project study area. The project site is located approximately 75 miles from the coast; the proposed actions would therefore not have any impacts on coastal resources or coastal barriers.

Department of Transportation Act: Sec. 4(f)

In order to preserve the natural beauty of certain areas and/or types of land, Section 4(f) of the DOT Act places restrictions on the use of any significant publicly owned recreational land, public park, recreation area, wildlife and waterfowl refuge or historic site of national, state, or local significance. Proposed actions must be reviewed to determine if they will have a physical or constructive impact to a Section 4(f) property.

A final piece of legislation that may affect Section 4(f) resources is Section 6(f) of the Land and Water Conservation Fund Act (L&WCFA), 16 US, and Section 4601; 36 CFR 59. Section 6(f) provides funds for buying or developing public use recreational lands through grants to local and state governments. Section 6(f) prevents conversion of lands purchased or developed with L&CWFA funds to non-recreation uses, unless the secretary of the Department of the Interior (DOI), through the National Park Service (NPS), approves the conversion. The conversion may only be approved via the following conditions: the conversion is consistent with the latest comprehensive statewide outdoor recreation plan when the approval occurs, and the converted property is replaced with other recreational use property, or reasonably equivalent usefulness and location for fair market value.

The Pennsylvania Department of Conservation and Natural Resources (DCNR) list of state parks was reviewed to determine if any state parks, recreation areas or refuges are located in the study area. The Department of Interior's National Park Service and USFWS list of federal resources were also reviewed to determine if any federal parks, conservation areas or wildlife refuges are located within one mile of Airport property. No federal or state 4(f) resources are located in the study area.

The DCNR also served as a resource for identifying local parks. As shown on **Figure 3.10.1**, there are several parks adjacent to the airport property but none within the study area. In developing alternatives, consideration should be made to avoid or minimize potential impacts related to constructive uses. Although

[40] http://www.dep.pa.gov/Business/Air/BAQ/ClimateChange/Pages/default.aspx

a constructive use does not physically occupy or require purchase of a Section 4(f) resource, this use occurs when an action would substantially impair that resource. Substantial impairment occurs only when the activities, features, or attributes of the resource that contribute to the resource's significance or enjoyment are substantially diminished. Potential causes of constructive use include shifts in user population because of direct use of bordering properties, and/or non-physical intrusions such as noise, air pollution, or other effects that would substantially impair the resource's use.

During the Section 106 process for the release of airport property used for the development of the FedEx Ground distribution facility, one historic property that qualifies as a Section 4(f) resource was identified within the project area, the Miller Farm (Bureau for Historic Preservation [BHP] Key Number 156212). The Miller Farm has been found eligible for listing in the National Register of Historic Places (NRHP). The section on Historic and Archeological Resources provides more information on the Miller Farm and Miller Farm Archaeological Site.

Farmlands

Figure 3.10.2 presents the different soil types and farmland classifications present within the airport property. As shown, the airfield and terminal areas of the Airport are primarily designated as Urban land-Udorthents, limestone complex; Urban land – Duffield complex; and Urban land. According to the United States Department of Agriculture, National Resources Conservation Service (NRCS), these soils are not classified as prime farmland or farmland of statewide importance. However, the remainder of the airport property is classified as prime farmland or farmland of statewide importance and several areas are currently used for agricultural purposes. Proposed development within the areas may require additional coordination with the local NRCS field office. In addition, there are Agricultural Security Areas and Agricultural Protection Zones north of the airport boundary (see **Figure 3.10.1**).

The Bureau of Farmland Preservation administers the Agricultural Security Area (ASA) program at the state level. ASAs are a tool for strengthening and protecting quality farmland from the urbanization of rural areas. The ASA program is voluntary for farmers/landowners. Petitions are submitted to township supervisors. As shown in **Figure 3.10.1** (presented previously), ASAs are located north and of the study area. There are no ASAs located within the study area.

Soil ID	Soil Type
ClA	Clarksburg silt loam, 0-3% slopes
ClB	Clarksburg silt loam, 3-8% slopes
CmA	Clarksburg silt loam, 0-3% slopes
DbB	Duffield silt loam, 3-8% slopes
Mb	Middlebury silt loam
Me	Middlebury silt loam
Ua	Udorthents
UgB	Urban land, 0-8% slopes
UmB	Urban land-Duffield complex, 0-8% slopes
UmD	Urban land-Duffield complex, 8-25% slopes
UoB	Urban land-Duffield complex, 0-8% slopes
UoD	Urban land-Duffield complex, 8-25% slopes
UudB	Urban land-Udorthents, limestone complex, 0-8% slopes
WaA	Washington silt loam, 0-3% slopes
WaB	Washington silt loam, 3-8& slopes
WaC	Washington silt loam, 8-15% slopes
WaD	Washington silt loam, 15-25% slopes

Race Street
Airport Road
Schoenersville Road
Lehigh Valley Thruway
22
378
987

Legend

- Airport Property Boundary
- USGS Soil Boundaries

On-Airport Soils

- Prime Farmland
- Farmland of Statewide Importance

Washington silt loam

- 0-3% slopes (Northampton)
- 3-8% slopes (Northampton)
- 8-15% slopes (Northampton)
- 15-25% slopes (Northampton)

Urban land-Udorthents, limestone complex

- 0-8% slopes (Northampton)

Urban land-Duffield complex

- 0-8% slopes (Lehigh)
- 0-8% slopes (Northampton)
- 8-25% slopes (Lehigh)
- 9-25% slopes (Northampton)

Urban land

- 0-8% slopes (Lehigh)

Udorthents

- Lehigh

Middlebury silt loam

- Lehigh
- Northampton

Duffield silt loam

- 3-8% slopes (Lehigh)

Clarksburg silt loam

- 0-3% slopes (Northampton)
- 0-3% slopes (Lehigh)
- 3-8% slopes (Northampton)

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet
When printed at 11" x17"

Lehigh Valley International Airport
Master Plan Update

Soils and Farmland

Figure 3.10.2

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Sources: Airport Property Line from Lehigh Northampton Airport Authority, Soil boundaries from USGS Soils Mapper/USDA/NRCS, data collected for Lehigh County and Northampton County. Aerial Imagery from Quantum Spatial. CREATED: November 2016 by C&S Engineers

Hazardous Materials, Solid Waste, and Pollution Prevention

The development of the Airport Master Plan Update will consider if alternatives may increase the quantity of solid waste generated by the Airport or affect the manner in which the Airport's solid waste is collected or disposed. Future airport development is not anticipated to significantly impact solid waste services and any permitting should be limited to temporary construction impacts. A Solid Waste Management and Recycling Plan is included in **Appendix J – Solid Waste Management and Recycling Plan**, which will help the Airport increase diversion rates and minimize waste.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1981 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) are two important statues that govern actions to construct and operate facilities. CERCLA provides for cleanup of any release of a hazardous substance (excluding petroleum) into the environment. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes.

In order to determine the potential for the proposed actions to impact hazardous materials, the EPA NEPAssist mapping tool was used. There are a number of RCRA sites on and surrounding the airport property including those owned by tenants and the Airport Authority itself, whose site is qualified as a small-quantity generator. This is typical of many airports that handle and dispense aircraft fuels and include other aeronautical activities such as maintenance. Procedures are in place at LVIA through the most recent 2017 update of their "Preparedness, Prevention, and Contingency (PPC) & Spill Prevention Response (SPR) Plan" to prevent spills. LVIA's PPC and SPR Plans are in compliance with state and federal National Pollutant Discharge Elimination System (NPDES) permitting programs and sufficiently outline spill and leak prevention and response measures, countermeasures, LVIA's emergency spill control network, and stormwater management best practices for quantity/quality control. However, it is not anticipated that any proposed improvements would increase the potential for exposure of hazardous materials.

In addition to the RCRA sites, there is an EPA Brownfield site located west of the Airport but off airport property. It is unlikely that any proposed actions would have any impact on this site (i.e., no acquisition is anticipated at that location).

Historic, Architectural, Archeological, and Cultural Resources

The National Historic Preservation Act of 1966 (NHPA) requires an initial review of a proposed action's potential environmental impact area to determine if it includes any properties that are listed in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The Archeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistoric, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project.

As shown on **Figure 3.10.1**, there are several eligible and listed landmarks as well as districts surrounding the Airport. In addition, there is an eligible district/property within the airport boundary on the north side of the property. Numerous cultural resources reports were prepared during the EA for the release of airport property used for the development of the FedEx Ground distribution facility and found that many of the

previously identified sites or districts had lost integrity and were no longer eligible for listing on the NRHP. The district shown on **Figure 3.10.1**, however, was deemed potentially eligible. The delineated site represents the Miller Farmstead, which was determined eligible for listing in the NRHP, significant under Criterion A for agriculture, from ca. 1850-1940. The Miller Farm is located at 149 Willowbrook Road, East Allen Township, Northampton County, Pennsylvania, and is owned by the Airport Authority.

It is comprised of approximately 106 acres, which include one abandoned dwelling, a potential summer kitchen, a barn, a machine shed/corn crib, a machine shed/combination structure, a tenant house, a shed, and agricultural fields. Although in poor condition and largely abandoned, the Miller Farm does retain integrity of location, design, setting, materials, workmanship, feeling, and association. The extant buildings communicate the agricultural history of the property.

Although the site has not yet been listed on the NRHP, should improvements or demolition be proposed, further cultural analysis would be required as part of the project-specific environmental compliance. As of present, the farmstead is expected to remain untouched during construction of the FedEx facility and there are no anticipated efforts to restore the property due to its structural instability.

Land Use

The most recent version of FAA Order 1050.1F separates land use compatibility related to noise from other potential land use impacts. Although there is not currently a threshold established for determining impacts, additional considerations will be incorporated into the development and selection of alternatives to minimize effects on the surrounding land uses.

Natural Resources and Energy Supply

Development projects may have the potential to change or increase energy requirements or use of consumable natural resources. Once specific projects or overall plans are finalized, the Airport Authority should evaluate any potential impacts to natural resources and energy supply. In addition, the Airport Authority should consider strategies to minimize resource consumption as much as possible.

Noise and Compatible Land Use

An update to the Airport's Part 150 Study Noise Exposure Maps (NEMs)[41] was recently completed and provided information for this overview. As documented in this study, the Airport has implemented a number of recommended noise abatement procedures that aim to limit noise associated with aircraft operations. These noise abatement procedures address both aircraft and helicopter operations to and from various runways and include the following:

- For departing aircraft, the traffic pattern altitude, or the altitude that aircraft fly for touch-and-go operations in a fixed pattern around the Airport, is 1,400 feet MSL or approximately 1,000 feet AGL for piston propeller aircraft and 2,000 feet MSL (approximately 1,600 feet AGL) for turbine-powered aircraft.

[41] Wyle Laboratories, Inc., and Lehigh-Northampton Airport Authority. *Lehigh Valley International Airport Part 150 Update-2015/2020 Noise Exposure Maps*. Rep. no. A40065. N.p.: n.p., 2016. Print Accessible at: http://www.flylvia.com/public-info/special-projects/noise-compatibility-study-part-150-update/public-outreach/

- When departing Runways 6-24, aircraft should fly the heading of the runway until 2,000 feet MSL.
- Turbojet aircraft departing Runway 31 should turn right heading 360 degrees until 2,000 feet MSL.
- Turbojet aircraft departing Runways 06, 13 and 24 are advised that they will be flying over noise sensitive areas.
- Runways 6-24 are named as "preferential" meaning the ATCT and the pilot should give preference to using these runways, wind and weather permitting.

While the above procedures are intended to reduce noise impacts on surrounding property, directions from ATCT, or the safety of the aircraft as judged by the pilot, can often dictate variations from these patterns.

The updated NEM Study included an analysis of baseline and future noise exposure associated with airport activity. Information used to determine present and future noise exposure include aircraft fleet mix, number of operations by time of day, current and predicted flight tracks, and percent distribution of runway use. The noise level descriptor used in the analysis is the Day-Night Average Noise Level (DNL), which is a composite noise metric accounting for the sound energy of all noise events in a 24-hour period. In order to account for increased human sensitivity to noise at night, a 10 decibel (dB) penalty is applied to operations occurring during nighttime hours, between 10:00 p.m. and 7:00 a.m. Within DNL, individual flight and run-up event noise exposures are estimated in terms of Sound Exposure Level (SEL) and Lmax, respectively. SEL is an integrated metric normalizing the acoustic energy of a single flyover event to one second. SEL and Lmax are expressed in A-weighted decibels (dB or dBA).

The noise analysis was completed using the FAA-approved Integrated Noise Model (INM version 7.0D). (The study was initiated prior to the release of the FAA's new Aviation Environmental Design Tool [AEDT]). The resultant 65 dB, 70 dB and 75 dB DNL contours from the model can be seen in **Figure 3.1.1**. Under existing conditions, the 65 dB DNL contour extends off-airport by approximately 700 feet near the end of Runway 24 and along the heading of Runway 6-24 to the northeast. To the southwest, the 65 dB DNL contour extends off-airport to the Lehigh River. The 70 dB DNL contour extends off-airport by only 250 feet near the end of Runway 24. The 75 dB DNL contour is fully contained within the airport boundary.[42] The noise contours shown in **Figure 3.1.1**, also depict noise-sensitive public buildings, such as schools, hospitals, and health care facilities. No noise-sensitive public buildings are affected by 65 dB DNL or greater.

Using the federally accepted land use compatibility matrix, the noise analysis shows that a total of 146 people are estimated to be exposed to 65 dB DNL or greater under existing conditions. Sixteen of the 765 acres exposed to DNL greater than or equal to 65 dB are residential in their use. It is important to note, however, that seven of these 16 acres of residential land use are located within the airport property boundary. The on-airport residential land use parcels are prior residential areas that have since been purchased by the airport. As a result, only nine acres of the residential land are considered incompatible. There are 61 residential properties exposed to DNL between 65 dB and 70 dB, 57 of which have already been sound insulated. Four of the 61 opted out of sound insulation treatment.

[42] Wyle Laboratories, Inc., and Lehigh-Northampton Airport Authority. *Lehigh Valley International Airport Part 150 Update-2015/2020 Noise Exposure Maps*. Rep. no. A40065. N.p.: n.p., 2016. Print.

The 65 dB, 70 dB and 75 dB DNL contours for 2020 annual average daily aircraft operations represent the forecast NEM. Under these conditions, the 65 dB DNL contour would extend off-airport by up to 700 feet near Runway 24 and along the heading of Runway 6-24 to the northeast. To the southwest, the 65 dB DNL contour would extend off-airport to the Lehigh River. The 70 dB DNL contour would extend off-airport by only 250 feet near Runway 24. The 75 dB DNL contour would be fully contained within the airport boundary. No noise-sensitive public buildings would be affected by 65 dB DNL or greater. A total of 133 people are estimated to be exposed to 65 dB DNL or greater in 2020. Relative to 2015, there would be 13 less people in this bracket in 2020. Sixteen of the 752 acres exposed to DNL greater than or equal to 65 dB are residential in their use. It is important to note that seven of these 16 acres of residential land use are located within the airport property boundary. The on-airport residential land use parcels are prior residential areas that have since been purchased by the airport. As a result, only nine acres of the residential land are considered incompatible. There would be 57 residential properties exposed to DNL between 65 dB and 70 dB, 53 of which have already been sound insulated. Four of the 57 opted out of sound insulation treatment.[43]

Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic Impacts

Socioeconomic impacts result from an action causing extensive relocation of residents without sufficient replacement housing unavailable; extensive relocation of community businesses that would cause severe economic hardship for affected communities; disruption of local traffic patterns that substantially reduce the Levels of Service (LOS) of roads serving the Airport and its surrounding communities; or a substantial loss in community tax base. Once the facility requirements are identified, the potential for impacts should be considered in the development and evaluation of alternatives.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, (February 11, 1994) was issued to ensure that each federal agency conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude persons or populations from participation, does not deny benefits, and does not subject to discrimination because of race, color, or national origin. When an action would cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, a significant impact may occur.

Any future potential development of the Airport is not anticipated to have a negative impact on minority or low-income populations.

Children's Environmental Health and Safety Risks

Executive Order 13045 (April 21, 1997) requires federal agencies to ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks. Federal agencies must identify and assess potential environmental health risks to

[43] Wyle Laboratories, Inc., and Lehigh-Norhtampton Airport Authority. *Lehigh Valley International Airport Part 150 Update-2015/2020 Noise Expsoure Maps*. Rep. no. A40065. N.p.: n.p., 2016. Print.

children. Potential environmental health risks are defined as risks to health that are attributable to products or substances that the child is likely to come in contact with or ingest, such as air, food, water, soil, and products.

Proposed actions will be considered to determine and minimize any potential environmental health risks to children in the area of the Airport.

Visual Effects

In order to assess the potential light emissions impacts, proposed airport lighting will be evaluated to determine if it will create an annoyance or interference to the surrounding community. A visual impact occurs when consultation with federal, state, or local agencies, tribes, or the public shows that these effects contrast with existing environments and is considered objectionable. Existing lighting consists of airfield, building, and obstruction lighting.

Lighting is not anticipated to differ drastically from existing installations. Coordination with local residents and owners of light sensitive sights would occur only if significant upgrades were proposed. Lighting improvements are typically eligible for categorically exclusion under NEPA.

Water Resources

Under FAA Order 1050.1F, Water Resources now encompasses Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers.

Wetlands

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as "those areas that are inundated by surface or ground water with a frequency sufficient to support...a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas..."

As shown on **Figure 3.10.1**, there is one wetland located on airport property, north of the Runway 13 end. According to the USFWS National Wetlands Inventory, this is a 6.11-acre freshwater forested/shrub wetland. A formal wetland delineation may need to be conducted for any proposed action located on or in close proximity to the wetland identified.

Floodplains

Floodplains (or flood zones) are defined as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year."

The Threshold of Significance (TOS) is exceeded when there is an encroachment on a base floodplain (100-year flood). An encroachment involves:

- A considerable probability of loss of life;
- Likely future damage associated with encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facilities; or

- A notable adverse impact on natural and beneficial flood plain values.

The Federal Emergency Management Agency (FEMA) is responsible for mapping known floodplains and publishing these maps as Flood Insurance Rate Maps (FIRMs). Map areas within the 100-year floodplain have an annual probability of flooding of 1 percent or greater. In Zone A, detailed analyses have not been performed; therefore, not depths or base flood elevations are shown within those zones. In Zone AE, base flood elevations are provided. Areas between the 100-year and 500-year floodplains have an annual probability of flooding of between 0.2 and 1 percent, and areas outside of the 500-year floodplain have an annual probability of flooding of less than 0.2 percent.

As shown in **Figure 3.10.1**, there are two small areas of airport property that fall within the FEMA 100-year Flood Zones A and AE. Both areas are north of the airfield on parcels that are noncontiguous to the main airport property. Therefore, it is unlikely that aeronautical development would have an impact on this flood zone.

Surface and Ground Water

Federal agencies are required to comply with the Clean Water Act (CWA) for any action that may affect water quality, including the control of any discharge into surface or ground water and the prevention or minimization of loss of wetlands. Agencies must also comply with the Fish and Wildlife Coordination Act if the proposed action impounds, diverts, drains, controls, or otherwise modifies the waters of any stream or other water body. Section 1424(e) of the Safe Drinking Water Act requires consultation with the EPA if a proposed action has the potential to contaminate an aquifer designated by the EPA as a sole or principal source of drinking water for the area.

According to the NEPAssist tool maintained by the EPA, the airport property spans three watersheds including the Catasauqua Creek Watershed to the north, the Lehigh River-Delaware River Watershed over which the airfield falls, and the Monocacy Creek Watershed to the east. There are two primary surface water features on the airport property - the Catasauqua Creek and an unnamed tributary shown on **Figure 3.10.1**. These waters are contaminated with pollutants contained in typical urban runoff including oil and grease, surfactant, heavy metals, solvents, pesticides, nutrients, and fecal coliform bacteria from livestock and pets. Both water bodies are classified as cold water fishes (CWF) and migratory fishes (MF) by Title 25, Chapter 93 of the Pennsylvania Code. In addition, the Lehigh River runs west of the Airport. Any impacts to these water bodies either directly or via runoff should be considered in the evaluation of proposed development. However, impacts will be mitigated due to implementation of Best Management Practices (BMPs) in compliance with applicable permits such as the National Pollutant Discharge Elimination System (NPDES) General Industrial Permit, which requires development of a Stormwater Pollution Prevention Plan (SWPPP).

Impacts to groundwater should also be considered, though during geotechnical investigations on the adjacent FedEx site, groundwater was only encountered in one test boring at a depth of approximately 32 feet below existing site grades.

Wild and Scenic Rivers

The Federal Wild and Scenic Rivers Act describes those river areas that are eligible for protection under the Act as free-flowing and possessing "…outstanding, remarkable, scenic, recreational, geologic, fish and

wildlife, historic, cultural, or other similar values." The Act restricts development within 1,000 feet of rivers identified as "wild and scenic."

The Nationwide Rivers Inventory (NRI) is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential Directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments.

In reviewing the NRI for Pennsylvania, there are 409.3 miles designated as wild and scenic; however, none of these segments are located within the vicinity of the Airport.